

What is claimed is:

5/9/17
5 1. An implantable prosthesis, comprising:

(a) a prosthetic component having first and second surfaces, the second surface adapted to be oriented toward bone in which component is to be implanted;

10 (b) at least one opening extending from the first surface to the second surface; the opening adapted to receive an insertion member and comprising (i) an extended frustoconical taper section extending from the first surface through a substantial portion of the opening and (ii) a section at the second surface having a smaller diameter than the portion of the taper at the first surface, the opening adapted to accommodate an insertion member at multiple orientations relative to the component; and

15 (c) an insertion member having a spherical or near-spherical head and adapted to be inserted into the opening such that the spherical or near-spherical head interfaces with the extended frustoconical taper section.

20 2. The implantable prosthesis of claim 1, wherein once the appropriate orientation of the insertion member is selected, the insertion member is adapted to be locked relative to the frustoconical taper section such that the head of the insertion member does not protrude beyond the first surface.

3. The implantable prosthesis of claim 1, wherein the section at the second surface is a flat edge, a chamfered edge, a beveled surface, a rounded surface, or a spherical surface.

5 4. The implantable prosthesis of claim 1, wherein the spherical or near-spherical head comprises an outer edge that is spherical, near-spherical, toroidal, elliptical, global, slightly curved, or rounded.

10 5. The implantable prosthesis of claim 1, wherein the insertion member comprises one or more of a bone screw, a bone peg, a bone spike, or an aperture cover.

15 6. The implantable prosthesis of claim 1, wherein the spherical or near-spherical head comprises a sliced portion of a sphere having a center point and wherein the head includes the center point.

20 7. The implantable prosthesis of claim 1, wherein the opening has an inner wall, the spherical or near-spherical head has an outer rim, and wherein the insertion member is adapted to be inserted into the opening at an angle while maintaining a constant point contact between the inner wall and the outer rim.

8. The implantable prosthesis of claim 1, wherein the prosthesis comprises a hip replacement system and wherein the first and second surfaces are surfaces of an acetabular cup.

5 9. The implantable prosthesis of claim 1, wherein the interface between the spherical or near-spherical head and the extended taper section comprises a liquid-tight seal.

10 10. The implantable prosthesis of claim 1, wherein the opening is a universal-type opening and wherein the insertion member comprises any one of bone screw, a bone peg, a bone spike, or an aperture cover, wherein any one of the bone screw, a bone peg, a bone spike, or an aperture cover comprises a universal-type spherical or near-spherical head that corresponds to the universal-type opening.

5 11. An implantable prosthesis, comprising:

(a) a prosthetic component having first and second surfaces, the second surface adapted to be oriented toward bone in which component is to be implanted;

20 (b) at least one opening extending from the first surface to the second surface; the opening adapted to receive an insertion member and comprising (i) an extended frustoconical taper section extending from the first surface through a substantial portion of the opening and (ii) a rounded section at the second surface having a smaller diameter than the portion of the taper at the first surface, the

opening adapted to accommodate an insertion member at multiple orientations relative to the component.

12. The implantable prosthesis of claim 11, wherein the opening is adapted to accommodate a spherical or near-spherical head insertion member such that the head of the insertion member interfaces with the extended frustoconical taper section.

13. An acetabular implant for fixation to a patient, comprising:

(a) an acetabular cup having an inner surface, an outer surface, and at least one opening extending from the inner surface to the outer surface, the outer surface adapted to be oriented toward bone in which component is to be implanted;

(b) the at least one opening having an extended frustoconical tapered section beginning at the inner surface; and

(c) a member for insertion into the opening, the member comprising a head having a spherically or near-spherically shaped portion that is adapted to interface with the extended frustoconical tapered section to lock and retain the insertion member at a desired orientation relative to the opening.

14. The acetabular implant of claim 13, wherein once the appropriate orientation of the insertion member is selected, the insertion member is adapted to be locked relative to the frustoconical taper section such that the head of the insertion member does not protrude beyond the first surface.

15. The acetabular implant of claim 13, wherein the spherical or near-spherical head comprises an outer edge that is spherical, near-spherical, toroidal, elliptical, global, slightly curved, or rounded.

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16. The acetabular implant of claim 13, wherein the opening has an inner wall, the spherical or near-spherical head has an outer rim, and wherein the insertion member is adapted to be inserted into the opening at an angle while maintaining a constant point contact between the inner wall and the outer rim.

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17. The acetabular implant of claim 13, wherein the interface between the spherical or near-spherical head and the extended taper section comprises a liquid-tight seal.

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18. The acetabular implant of claim 13, wherein the member comprises a bone screw, a bone peg, a bone spike, or an opening cover.

19. An insertion member for use with a prosthesis having a universal connecting portion, comprising:

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(a) a head having an outer edge shaped to approximate at least a portion of a sphere, a near-sphere, a toroid, an ellipse, a globe, a slight curve, or rounded portion ; and

(b) a portion extending from the head adapted to be received by an opening of the prosthesis.

20. The insertion member of claim 19, wherein the insertion member
5 comprises a bone peg, a bone screw, a bone spike, or an opening cover.

21. The insertion member of claim 19, further comprising a prosthesis
having an opening with an extended frustoconical taper section and wherein the
head of the insertion member is adapted to interface and lock with the opening.

22. The insertion member of claim 21, wherein the interface between the
head and the extended taper section comprises a liquid-tight seal.

23. The insertion member of claim 19, wherein the head comprises a
15 sliced portion of a sphere or a near-sphere having a center point and wherein the
head includes the center point.

24. The insertion member of claim 19, wherein the opening has an inner
wall, the head has an outer rim, and wherein the insertion member is adapted to be
20 inserted into the opening at an angle while maintaining a constant point contact
between the inner wall and the outer rim.

25. An acetabular implant for fixation to a patient, comprising:

(a) an acetabular cup having an inner surface, an outer surface, and at least one opening extending from the inner surface to the outer surface,

(b) the at least one opening having an extended frustoconical tapered section beginning at the inner surface and a second section at the outer surface having a diameter smaller than the diameter at the inner surface;

(c) a member for insertion into the opening, the member comprising a head having a spherically or near-spherically-shaped portion that is adapted to interface with the frustoconical extended tapered section to lock and retain the insertion member at a desired orientation relative to the opening.

26. The acetabular cup of claim 25, further comprising:

(d) a liner for lining the inner surface of the acetabular cup; and

(e) a femoral component for insertion into a patient's femur and adapted to cooperate with the acetabular cup and liner.

27. A method of replacing at least part of a hip joint in a patient, comprising:

(a) providing an acetabular cup having an inner surface, an outer surface, and at least one opening extending from the inner surface to the outer surface; the opening adapted to receive an insertion member and comprising (i) an extended frustoconical taper section extending from the first surface through a substantial portion of the opening and (ii) a section at the second surface having a smaller

diameter than the portion of the taper at the first surface, the opening adapted to accommodate an insertion member at multiple orientations relative to the component; and

(b) providing at least one insertion member having a spherical or near-spherical head and adapted to be inserted into the opening such that the spherical or near-spherical head interfaces with the extended frustoconical taper section;

(c) preparing the bone of the patient's hip to receive the acetabular cup; and

(d) implanting the acetabular cup, wherein once the appropriate orientation of the insertion member is selected, the insertion member is adapted to be locked relative to the frustoconical taper section.

28. The method of claim 27, wherein the head of the insertion member does not protrude beyond the first surface.

29. The method of claim 27, further comprising providing an acetabular cup liner and positioning the acetabular cup liner in the acetabular cup.

30. The method of claim 27, further comprising providing a femoral prosthesis and positioning the femoral prosthesis in a patient's femur, such that the femoral prosthesis can cooperate with the acetabular cup.

31. The method of claim 27, wherein once the appropriate orientation of the insertion member is selected, the insertion member is adapted to be locked relative to the frustoconical taper section such that the head of the insertion member does not protrude beyond the first surface.

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32. The method of claim 27, wherein the section at the second surface is a flat edge, a chamfered edge, a beveled surface, a rounded surface, or a spherical surface.

33. The method of claim 27, wherein the spherical or near-spherical head comprises an outer edge that is spherical, near-spherical, toroidal, elliptical, global, slightly curved, or rounded.

34. The method of claim 27, wherein the insertion member comprises one or more of a bone screw, a bone peg, a bone spike, or an aperture cover.

35. The method of claim 27, wherein the spherical or near-spherical head comprises a sliced portion of a sphere having a center point and wherein the head includes the center point.

36. The method of claim 27, wherein the opening has an inner wall, the spherical or near-spherical head has an outer rim, and wherein the insertion

member is adapted to be inserted into the opening at an angle while maintaining a constant point contact between the inner wall and the outer rim.

37. The method of claim 27, wherein the interface between the spherical
5 or near-spherical head and the extended taper section comprises a liquid-tight seal.

38. The method of claim 27, wherein the opening is a universal-type
opening and wherein the insertion member comprises any one of bone screw, a
10 bone peg, a bone spike, or an aperture cover, wherein any one of the bone screw,
a bone peg, a bone spike, or an aperture cover comprises a universal-type
spherical or near-spherical head that corresponds to the universal-type opening.